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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,257	07/09/2003	Roland van Gelder	US010201A	9469
7590	07/19/2004		EXAMINER	
			SEVER, ANDREW T	
			ART UNIT	PAPER NUMBER
			2851	

DATE MAILED: 07/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/616,257	VAN GELDER ET AL.	
	Examiner	Art Unit	
	Andrew T Sever	2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on ____.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-14 and 16-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-14 and 16-19 is/are rejected.
- 7) Claim(s) 14 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 09 July 2003 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____. | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

Priority

1. Applicant's claim for domestic priority (continuation of 09/845,897) is acknowledged.

Claim Objections

2. Claim 14 objected to because of the following informalities: the term "less than about" renders the claim indefinite. Appropriate correction is required.

The term "about" in claim 14 is a relative term, which renders the claim indefinite. The term "about" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is difficult to know what is less than about 30 nanometers. Does this include 31 nanometers, which is less, then about 30 nanometers, provided about 30 nanometers includes 40 nanometers? For purposes of a prior art search claim 14 will be assumed to read a film having a retardance of less than 30 nanometers.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-9, 11, 12, 14, and 16-19 rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt et al. (US 5,576,854.)

Schmidt et al. teaches in figure 1 an off-axis (as is claimed by applicant's claim 5) apparatus for use in a color video projection display system comprising one reflective light valve (28) (as is claimed by applicant's claim 2, 6, 11) for modulating an incident light from a light source (24) of at least one color with a corresponding signal and a projection optical system (20) for projecting the modulated light to a viewable display.

Schmidt further teaches a polarizer (22), which is disposed both in the input optical path and the output optical path and thus serves as both an input optical path polarizer and output optical path polarizer, and a quarter wave plate (26). The quarter wave plate, inherently has a retardance of $.25 \lambda$ (and as taught by Schmidt's claim 1), where λ is the wavelength of the modulated light. Using a range of 600 nm - 400 nm as the range of wavelengths of electromagnetic waves considered visible light, the quarter wave plate would have a retardance of 150 nm to 100 nm. Schmidt teaches in column 2 lines 48-65 that this quarter wave plate is provided in order to improve the contrast ratio by moving the black level closer to being completely black. Schmidt, however, does not teach explicitly a "low-retardance film" arranged

within the input optical path of the system between the optical polarizer and at least one panel or arranged in the output path between one panel and an output optical path polarizer.

Schmidt teaches in column 5 lines 20-35 that the quarter wave plate can be modified in order to compensate for the birefringence error induced by the counter electrode substrate of the LCLV (28) and to further compensate for geometrical imperfections of the polarizer (22). Schmidt teaches that this modification consist of adding an additional retardance of 0.02λ to the quarter wave plate. This additional retardance, using the above range of wavelengths, would provide an additional retardance of 12 nm – 8 nm, which according to applicant's disclosure and applicant's claim 14, would be the retardance of a low-retardance film.

Low-retardance films are well known in the art for adding additional retardance to various components, such as lenses, polarizers, light valves and other various optical components. Schmidt's wave plate's additional retardance is not specified to have been provided by the addition of a low-retardance film, however since this additional retardance serves a purpose that the quarter wave plate does not (namely correcting for birefringence error induced by the counter electrode substrate), it would have been obvious to one of ordinary art at the time the invention was made that a low-retardance film could be used for the same purpose as the additional retardance on the wave plate include a retarder having a retardance of 0.02λ with or without a quarter wave plate in order to correct for birefringence error as well as compensate for geometrical imperfections of the polarizer and this would provided the benefit of using a normal quarter wave plate with the addition of a relatively inexpensive low-retardance film, which would reduce the overall expense of the projector (as obtaining a quarter wave plate that has the

additional retardance without a low-retardance film for providing that retardance would require a non-standard part and hence would carry additional expense.

With regards to applicant's claims 3, 4 and 7 it is was well known in the art that reflective liquid crystal light valves could be replaced with transmission type liquid crystal light valves with minimal modification of the optical apparatus. Further its equally well known in the art that both on-axis and off axis systems have inherit advantages and disadvantages over each other and are therefore interchangeable depending on the specific needs of a particular apparatus.

Transmission type liquid crystal light valves in either on or off axis systems would be prone to the same problems that the additional retardance solves in the above-mentioned reflective light valves in an off-axis system. Therefore it would have been obvious to one of ordinary art at the time the invention was made to include a retarder having a retardance of 0.02λ with or without a quarter wave plate in order to correct for birefringence error as well as compensate for geometrical imperfections of the polarizer in an on-axis projection display system having a transmission type LCD.

With regards to applicant's claim 8 and 9, Schmidt, does not teach using a three-panel projection display system. It was well known in the art that brighter and higher resolution projections can be made by splitting the white light into 3 separate colored beams and either transmitting them through or reflecting them off of individual light valves, instead of using a single light valve as is taught by Schmidt et al. The problems associated with the single light valve (either transmission type or reflection type), would be also present in a three-panel projection display and most likely would be at least three times as severe (due to the birefringence error coming from three LCD's instead of one). Therefore it would have been

obvious to one of ordinary skill in the art at the time the invention was made to include Schmidt's quarter wave plate with additional retardance in a projection apparatus having three separate color beams and placing a single quarter wave plate before the light is split into the three separate color beams (as is claimed by applicant in applicant's claim 9) in order to produce a brighter higher resolution image with a high contrast ratio due to the extra retardance compensating for birefringence error as well as geometrical imperfections of the polarizer.

With regards to applicant's claims 11 and 12, the additional retardance is disposed on the quarter wave plate. Since the quarter wave plate in Schmidt's apparatus is disposed in both the input and output optical path, the single quarter wave plate with additional retardance is both arranged within an output optical path as well as the input optical path as is claimed in claims 11 and 12.

With regards to applicant's claims 16 and 17, Schmidt teaches in column 4 lines 62-65 that the reflective light valve is a liquid crystal light valve. Liquid crystal on silicon (LCoS) were well known by those possessing ordinary skill in the art at the time the invention was made to be commonly used for liquid crystal light valves, therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to use LCoS light valves in Schmidt's apparatus as LCoS light valves are common on hand parts.

With regards to applicant's claim 19, the existence of Schmidt's apparatus implies the existence of a method for using it.

Art Unit: 2851

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt et al. (US 5,576,854) as applied to claim 1-7, 11, 12, 14, and 16-19 above, and further in view of Bryars (US 5,986,815.)

As described in more detail above, Schmidt et al. teaches an apparatus for use in a color video projection display system comprising one reflective light valve for modulating an incident light from a light source of at least one color with a corresponding signal and a projection optical system for projecting the modulated light to a viewable display. Schmidt further teaches a polarizer and a quarter wave plate; this quarter wave plate is provided in order to improve the contrast ratio by moving the black level closer to being completely black. Schmidt further teaches a low-retardance film or retarder disposed on the quarter wave plate to increase its retardance to $.27 \lambda$ an increase of $.2 \lambda$.

Schmidt, however, does not teach using a three-panel projection display system. It was well known in the art that brighter and higher resolution projections can be made by splitting the white light into three separate colored beams and either transmitting them through or reflecting them off of individual light valves, instead of using a single light valve as is taught by Schmidt et al. The problems associated with the single light valve (either transmission type or reflection type), would be also present in a three-panel projection display and most likely would be 3 times as severe (due to the birefringence error coming from three LCD's instead of one).

Bryars (US 5,986,815) teaches in figure 1 a color video projection display system having three separate beams and 3 separate reflective LCD's (110, 130, 90). Bryars further teaches placing retarders (100, 120, 80) in the beam path in order to increase the contrast ratio (see column 19 lines 37-42. These retarders are placed right before each individual LCD, and the

retarders are specifically designed for the specific wavelength of the light the LCD's modulate. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use Schmidt's quarter wave plate with addition retardance, namely 0.02λ , in a three panel projection display system in order to produce a brighter, higher resolution image than Schmidt's, but having the advantage of a higher contrast ratio as taught by Schmidt.

6. Claim 13 rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt as applied to claims 1-12 and 14-19 above, and further in view of Takahara et al. (US 5,875,008)

As described in more detail above, Schmidt et al. teaches an apparatus for use in a color video projection display system comprising one reflective light valve for modulating an incident light from a light source of at least one color with a corresponding signal and a projection optical system for projecting the modulated light to a viewable display. Schmidt further teaches a polarizer and a quarter wave plate; this quarter wave plate is provided in order to improve the contrast ratio by moving the black level closer to being completely black. Schmidt further teaches a low-retardance film or retarder disposed on the quarter wave plate to increase its retardance to $.27 \lambda$ an increase of $.2 \lambda$.

Schmidt, however, does not teach that the quarter wave plate with extra retardance is made of diacetate film. Takahara et al. teaches in column 7 lines 7-14 that phase plates can be made of various materials including diacetate film as is claimed in applicant's claim 13. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use diacetate film for the quarter wave plate with extra retardance in Schmidt's apparatus, if diacetate film was the type of retarder that was on hand.

Conclusion

7. This is a continuation of applicant's earlier Application No. 09/845,897. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T Sever whose telephone number is 571-272-2128. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AS

A handwritten signature in black ink, appearing to read "David Gray".

David Gray
Primary Examiner